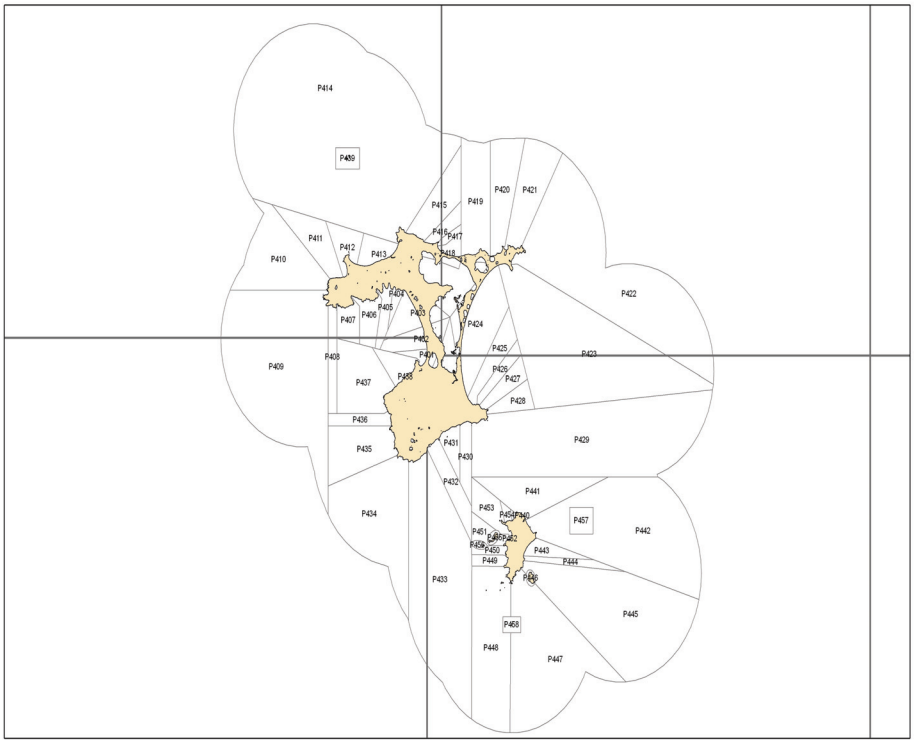
PAUA (PAU 4) – Chatham Islands

(Haliotis iris)
Paua



1. FISHERY SUMMARY

1.1 Commercial fisheries

PAU 4 was introduced into the Quota Management System in 1986–87 with a TACC of 261 t. The TACC has since increased to 326 t as a result of the appeal process. The fishing year runs from 1 October through 30 September. In what follows, the fishing year is referred to using the second part, *viz* 2002–03 is termed "2003". Reporting of catch in PAU 4 was changed from reporting in greenweight to reporting in meatweight at the beginning of the 2009-10 fishing year. The reasons for the change were to curb the use of the green to meat weight conversion factor to misreport catch and to encourage catch spreading by making it commercially viable for fishers to harvest areas where shells are heavily fouled. Heavy fouling on shells is a problem that occurs in quite a few areas around the Chatham Islands.

Estimated landing for PAU 4 are shown in Table 1.

Table 1: TACC and reported landings (t) of paua in PAU 4 from 1995–96 to 2008–09.

Year	Landings	TACC
1995–96	220.17	326.54
1996–97	251.71	326.54
1997–98	301.69	326.54
1998–99	281.76	326.54
1999–00	321.56	326.54
2000–01	326.89	326.54
2001–02	321.64	326.54
2002–03	325.62	326.54
2003–04	325.85	326.54
2004–05	319.24	326.54
2005–06	322.53	326.54
2006–07	322.76	326.54
2007–08	323.98	326.54
2008–09	324.18	326.54

In recent years the commercial paua fishery has implemented a number of voluntary management actions in most QMAs. Agreement to these actions has been formalised within each QMA through the

development of an Annual Operational Plan (AOP) that is agreed to and signed by all Quota and ACE holders within the fishery. The plan explains the voluntary management actions that will be undertaken for the fishing year. The main actions of the AOP for PAU 4 for the 2009-10 fishing year are outlined below (Table 2). Because of the uncertainty of the status of the stocks in this fishery the Paua Industry Council are engaging in discussions with Quota holders regarding implementing some precautionary voluntary management actions, for example shelving a percentage of ACE for the 2010-11 fishing year.

Table 2: Summary of Annual Operational Plan for PAU 4 for the 2009-10 fishing year

Minimum harvest size	127mm
Data Collection – Catch sampling	Catch Sampling: each fishing operation is asked to collect a minimum of 6 catch samples ("red bag" sample kits will be supplied) during the course of their fishing year.
Data Collection – Data Loggers	The use of data loggers by all divers will be implemented over 2009-10
General Operating Procedures	Details on procedures are available in the AOP.
Monitoring of the status of the Pau4 bio-mass	If there is a continuing belief amongst the majority of divers that the Pau4 bio-mass is in decline, an action plan will be put to quota owners by June 2010 to address this.

1.2 Recreational fisheries

There are no estimates of recreational catch for PAU 4. The 1996, 1999–2000 and 2000–01 national marine recreational fishing surveys did not included the Chatham Islands.

1.3 Customary non-commercial fisheries

There are no estimates of customary catch for PAU 4. For the 2004 stock assessment this catch was assumed to be zero.

1.4 Illegal catch

There are no estimates of illegal catch for PAU 4. For the 2004 stock assessment this catch was assumed to be zero.

1.5 Other sources of mortality

Refer to the Paua introduction Working Group Report

2. BIOLOGY

Refer to PAUintro Working Group Report

3. STOCKS AND AREAS

The present Fishstock boundaries may not represent a single discrete paua stock for PAU 4.

4. STOCK ASSESSMENT

4.1 Estimates of fishery parameters and abundance

A standardized CPUE analyses (Fu 2010) from 1989-90 to 2007-08 was completed for PAU 4 in February 2010.

The Shellfish Working Group (SFWG) agreed that due to extensive misreporting of catch in PAU 4, catch and effort data from the Fisheries Statistical Unit and from the CELR and PCELR forms is inadequate to use for any CPUE analyses and therefore, CPUE cannot be used as an index of abundance in this fishery.

4.2 Stock assessment 2004

The last stock assessment for PAU 4 was completed in 2004 (Breen et al 2004). A Bayesian length-based stock assessment model was applied to PAU 4 to estimate stock status and yield. A reference

period from 1991–93 was chosen. This was a period after which exploitation rates increased and then leveled off, and after which biomass declined somewhat and then stabilised. It was not intended as a target. Assessment results suggested that current recruitment biomass was just above $B_{AV,}$ but with high uncertainty (83% to 125%). and current spawning biomass appeared higher than S_{AV}, (130%), but this conclusion could have been sensitive to maturity ogives. Projections suggested the 2007 recruited and spawning biomasses could be above B_{AV} but this was uncertain.

The SFWG advised that major uncertainties in the assessment required the results to be treated with great caution. The major uncertainties included very sparse research diver survey data, misreported CELR and PCELR data, growth and length frequency data most likely not being representative of the whole population an assuming CPUE to be an appropriate index of abundance.

In February 2010 the SFWG agreed that due to the lack of adequate data as input into the Bayesian length-based model, a stock assessment for PAU 4 using this model was not appropriate.

4.3 Biomass estimates

There are no current biomass estimates for PAU 4.

4.4 Estimation of Maximum Constant Yield (MCY)

No estimate of MCY has been made for PAU 4.

4.5 Estimation of Current Annual Yield (CAY)

No estimate of CAY has been made for PAU 4.

5. STATUS OF THE STOCKS

The current status of the PAU 4 stock is unknown.

TACCs and reported landings for the 2008–09 fishing year are summarised in Table 8.

Table 5: Summary of TACC (t) and reported landings (t) of PAU 4 for 2008–09 fishing year

QMA	Actual TACC	Reported landings
PAU 4	326.54	324.18

6. FOR FURTHER INFORMATION

Breen PA., Kim SW. 2004. The 2004 stock assessment of paua (*Haliotis iris*) in PAU 4. New Zealand Fisheries Assessment Report 2004/55. 79p.

Fu D.2010. Summary of catch and effort data and standardised CPUE analyses for paua (*Haliotis iris*) in PAU 4, 1989–90 to 2007–08. Fisheries Research Report 2008/01. 50p

Naylor JR., Andrew NL., Kim SW. 2003. Fishery independent surveys of the relative abundance, size-structure, and growth of paua (*Haliotis iris*) in PAU 4. New Zealand Fisheries Assessment Report 2003/08. 16p.

Pirker JG. 1992. Growth, shell–ring deposition and mortality of paua (*Haliotis iris* Martyn) in the Kaikoura region. MSc thesis, University of Canterbury. 165p.

Sainsbury KJ. 1982. Population dynamics and fishery management of the paua, *Haliotis iris*. 1. Population structure, growth, reproduction and mortality. New Zealand Journal of Marine and Freshwater Research 16: 147–161.

Schiel DR. 1992. The paua (abalone) fishery of New Zealand. In: Shepherd SA., Tegner MJ., Guzman del Proo S. eds., Abalone of the World: Biology, fisheries, and culture. Blackwell Scientific, Oxford.

Schiel DR., Breen PA. 1991. Population structure, ageing and fishing mortality of the New Zealand abalone Haliotis iris. Fishery Bulletin 89: 681–691.